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Quality assessment in fish

Quality.....

- Most often "quality" refers to the aesthetic appearance and freshness or degree of spoilage which the fish has undergone.
- It may also involve safety aspects such as being free from harmful bacteria, parasites or chemicals.
- It is important to remember that "quality" implies different things to different people and is a term which must be defined in association with an individual product type.
- For example, it is often thought that the best quality is found in fish which are consumed within the first few hours post mortem.
- However, very fresh fish which are in rigor mortis are difficult to fillet and skin and are often unsuitable for smoking.
- Thus, for the processor, slightly older fish which have passed through the rigor process are more desirable.

Methods.....

- The methods for evaluation of fresh fish quality may be conveniently divided into two categories: **sensory instrumental or chemical**
- Since the consumer is the ultimate judge of quality, most chemical or instrumental methods must be correlated with sensory evaluation before being used in the laboratory.
- However, sensory methods must be performed scientifically under carefully controlled conditions so that the effects of test environment, personal bias, etc., may be reduced.

Sensory methods


- Sensory evaluation is defined as the scientific discipline used to evoke, measure, analyze and interpret reactions to the characteristics of food as perceived through the senses of sight, smell, taste, touch and hearing.
- Most sensory characteristics can only be measured meaningfully by humans.
- However, advances are being made in the development of instruments that can measure individual quality changes.
- Instruments capable of measuring parameters included in the sensory profile are the Instron, Bohlin Rheometer for measuring texture and other rheologic properties.
- Microscopic methods combined with image analysis are used to assess structural changes and "the artificial nose" to evaluate odour profile (Nanto et al., 1993).

Sensory process

- In sensory analysis appearance, odour, flavour and texture are evaluated using the human senses.

Scientifically, the process can be divided into three steps.

- *Detection of a stimulus by the human sense organs;*
- *evaluation and interpretation by a mental process; and then*
- *the response of the assessor to the stimuli.*
- Variations among individuals in the response of the same level of stimuli can vary and can contribute to a non-conclusive answer of the test.
- People can, for instance, differ widely in their response to colour (colour blindness) and also in their sensitivity to chemical stimuli. Some people cannot taste rancid flavour and some have a very low response to cold-storage flavour. It is very important to be aware of these differences when selecting and training judges for sensory analysis.

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- Interpretation of the stimulus and response must be trained very carefully in order to receive objective responses which describe features of the fish being evaluated.
 - It is very easy to give an objective answer to the question: is the fish in rigor (completely stiff), but more training is needed if the assessor has to decide whether the fish is *post* or pre-rigor.
 - Subjective assessment, where the response is based on the assessor's preference for a product, can be applied in the fields like market research and product development where the reaction of the consumer is needed.

Sensory methods

- The analytical objective test used in quality control can be divided into two groups:
discriminative tests and descriptive tests
- Discriminative testing is used to determine if a difference exists between samples
(triangle test, ranking test)
- Descriptive tests are used to determine the nature and intensity of the differences **(profiling and quality tests)**
- The subjective test is an affective test based on a measure of preference or acceptance

Sensory methods for fish

- Sensory score sheet
- Fresh fish and cooked fish


Instrumental sensory analysis:

- Texture analyzer
- Colour analyzer etc

Chemical methods

- Quality indices for fish quality assessment

TMA	1.5mg TMA nitrogen/100g fish	10-15 mg TMA nitrogen/100g fish
TVBN	35-40 mg of TVB nitrogen/100g fish	50-70 mg
	Salted and Dried fish 100-200mg	
PV	Below 10	Above 20
TBA	Less than 2	More than 2

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- Hypoxanthine 0-8 micromoles/g
 - pH
 - Ammonia
 - TPC

K value

- Ratio
- Expressed in %
- Range 0– 100
- Index of fish quality

Histamine

- Scombroid poisoning
- Tuna, mackerel etc
- Histamine develops after 40 hrs of freshly caught fish
- Symptoms of poisoning: headache, rashes, gastro intestinal disorders
- Histidine \rightarrow Histamine
- Bacterial action – decarboxylating bacteria
- Other amines – cadaverine, putrescine
- US standard
- Indian standard



Summary